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ABSTRACT

This report on the TMT (Training Modules for Trainers) Project, part of the Special Discretionary Grant Program developed by the Michigan Department of Education (MDE) in response to the need for coordinated training activities, begins with a discussion of the emerging problem of upgrading teachers' computer literacy skills. A description of the project is then presented, including the establishment of five regional Software Evaluation and Training Centers to create training modules; the competency-based trainer-of-trainers model used for creating modules for both teachers and their trainers; seminars conducted to establish educational computing competencies; the TMT modules, including their format, their use with various audiences, and steps in their use; and a 3-day workshop conducted in April 1985 to give initial training and pilot five modules. Preliminary observations of training sessions at different sites with participants from diverse fields of education are reported, noting the needs both for adaptation of the instructional materials for different groups, and for additional incentives to attract participants. It is concluded that the success of the modules is due to their relevance and currency, and that the project needs to encourage participation by providing a uniform format for sharing and discussing critical issues in training Michigan teachers in the best use of microcomputers. Two references are listed and an example of a computer conference session is appended. (DJR)

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Addressing the Challenges of Training Competent Trainers in Computer Literacy

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THE EMERGING PROBLEM

The history of microcomputer use in the schools has been relatively short, yet filled with dramatic changes. Radical visions of the near future are being advanced with the ever increasing sophistication (and decreasing costs) of hardware and software. For instance, a three and one-half inch videodisc player, when connected to a microcomputer, has the capacity to store and retrieve the contents of an entire thirty volume encyclopedia. An even more remarkable example is provided by those who predict that schools as we know them will be replaced by software and hardware targeted for home learning use and other non-traditional educational environments. While these predictions may or may not be fulfilled, teachers can be assured of a constantly changing environment for applied educational technology. The appropriate training of teachers to address microcomputer use is one function that is unable to keep pace with the rapid technological advancements being made. Indeed, it has often been difficult to know what the training criteria should be.

Educators nation-wide are struggling not only to determine the best response to the problem of upgrading teacher computer literacy skills, but to clarify and define a continuously changing picture. According to a recent survey (Reinhold and Corkett, 1985), every state is active in training teachers for classroom computer use. The growth of microcomputer use in the schools has been so rapid, that there is a need to respond to teachers' needs for training. In the absence of empirical guidelines or a state mandate, various groups and agencies in the state of Michigan have begun to meet the demand for the training of teachers in the classroom use of microcomputers. Local and intermediate school districts (ISD), Regional Educational Media Centers (REMC), colleges and universities, and special interest groups (eg. Michigan Association of Computer Users in Learning [MACUL], Michigan Association of Media in Education [MAME], the Michigan Education Association [MEA], and others), have all directed some efforts and resources to address this training need.

Ideally, all of these agencies would cooperate to share ideas, materials, and other resources in a way similar to that which exists among other agencies in the state such as the county and educational library systems. There are, however, a number of factors which inhibit the development of a collaborative model of resource sharing for

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microcomputer technology. Among these are: (1) educational agencies spend so much time in simply keeping up with the technology that little time is left to establish a continuing dialog with other agencies , (2) because the field is so new, sufficient time has not elapsed for the development of cooperative networks and, (3)ownership and responsibility by a specific projessional group has yet to be determined.

In Better Education for Michigan Citizens: A Blueprint for Action, the Michigan State Board of Education states that a need exists to "...provide access to training for teachers in classroom application of computer technology, as well as access to training for administrators in educational management applications." Reference is also made to setting "...standards for certification of all teachers in the use of computers." In order to address these issues, The Michigan Department of Education (MDE) created the Special Discretionary Grants Program as one way in which the state could begin to provide for coordinated training efforts.

Responses to a statewide mail survey (number of districts = 269, or 51% of the districts in Michigan) responded) demonstrate a need for training, and also points to the changing nature of the type of training educators require.

Table I

PERCENT OF LEVEL OF INSERVICE NEEDS

determined by central administration	23%
general needs	43%
specific needs	34%

Table I indicates that 43% of the respondents focus on general needs. Overall, one would expect that as a school district becomes more experienced with microcomputers, their inservice needs would change from general needs to more specific. Future surveys should validate this hypothesis. Some districts indicate that central administration determines thier needs, however it is not clear what method of analysis is used or whether gerneral or specific needs are found. The training and training materials have been targeted for these general levels.

Table II

PERCENT OF DISTRICTS WITH ON-GOING COMPUTER TRAINING

yes	66%
no	34%

Table II indicates that most districts have some type of on-going training program although there is a significant portion of school districts without one. The TMT project hopes to impact on both types of districts by providing quality material for those with on-going programs, and providing material to help those districts without on-going programs establish one.

Table III

PERCENT OF TEACHERS
LEVEL OF COMPUTER USAGE

never use	50%
occasional use	30%
use frequently	20%

Table III indicates that the number of teachers using and not using computers are about evenly divided. It is hoped that with the additional training and recognition of these trainers as change agents, that the number of users will increase.

Table IV

PERCENT OF AGENCY PROVIDED TRAINING

locally	20%	ISD	7%
REMC	17%	Multiple Sources	5%
College/Univ.	14%	No Response	37%

Respondents reported a fairly even distrbution of training providers. Although the modules are targeted for the local level (which comprises the highest percentage of training), they can be used by other sources as well.

This is initial survey established a baseline for comparisons in subsequent years. A fifty-one percent reponse rate was considered a good return however on follow-up of non-respondents it was noticed that many of the districts not returning surveys tended to be districts that do not have computers or training programs. Therefore this sample is probably biased in the direction of districts with computers and training programs. It is important to seek data on those nonresponding districts since part of the objective of this project is to stimulate change in those districts. Subsequent studies are being planned for this year.

Adequately trained teachers are essential to the effective use of microcomputers in the schools. In order to create a core of teachers who can effectively integrate microcomputers into their local curricula, training programs must exist to train them in effective and efficient use of both the hardware and courseware. Although training programs exist in some individual districts and elsewhere, there are limitations to the amount of resources that these and other agencies can bring to bear on the problem. The issue of "reinventing the wheel" also arises - if materials exist in a usable form somewhere in the state, it is questionable that the best use of time and money would be for another group to re-create similar materials. In addition, there are several potential weaknesses, such as the absence of a comprehensive statewide training plan, the lack of uniformity in training, the lack of depth in the material, and the lack of a consistent plan for implementation.

A REPONSE TO THE PROBLEM

The Training Modules for Trainers Project

As part of the Special Discretionary Grants Program, five regional Software Evaluation and Training Centers were established along with a a center responsible for the creation of training modules. This center, Project TMT (Training Modules for Trainers), is located at The University of Michigan. The project was charged with developing and initiating a process by which existing training materials in the state would be collected, edited and synthesized. Various collection strategies were employed, ranging from gathering written materials to observing trainers as they deliver workshops. Where material was insufficient, Project staff reviewed the available literature. The Microcomputer Network Commitee was established to co-ordinate the activities of the six projects.

The Trainer of Trainers Model

Project TMT is using a competency based trainer-of-trainers model which operates at two levels of competencies - the teacher level and the trainer level (Bauman, 1979) The model consists of two basic phases, the creation of competency-based modules and the actual training of trainers in the use of the modules. The modules themselves provide a basis for consistent and uniform training in Michigan. Since it is beyond the scope of the project to train all teachers in the state, a logical, cost-effective approach is to begin the process by training a number of trainers in each regional center, who would then train other trainers. The original trainers selected by the regional centers are representative of potential trainers throughout the state. This group that will effectively promote the modules, and will notify others who are interested in becoming trainers. The trainers are expected to offer workshops in their local school districts, in addition to training they may offer at regional or intermediate centers. In the TMT model of a state-wide training system, there is a need for two types of trainers, the regional trainers (such as ISD or REMC's) and local teachers serving as trainers.

Competency-based training

During its second year of operation, Project TMT conducted seminars to establish educational computing competencies. Experts throughout the state gathered to create a list of competencies for each of the thirteen topic areas. The lists of module topics, goals and competencies appear in Appendix 1. A competency based training program was then created, using the competencies for each topic as a starting point. The training program provides comprehensive instructional guidelines for trainers, workshops which relate to these competencies, an assessment of trainers' competencies, and a core of competent trainers in the state. It is expected that a minimum of ten trainers in each of the five software evaluation and training centers will be trained to be competent in the thirteen topics.

The list of competencies is combined with a self-assessment (see Appendix 2) that can be used by the trainer both before and after the session. By use of this instrument, workshop participants are asked to rate their knowledge about experience with, and confidence in their. It is realistic for trainers to expect to see some degree of improvement in each of the competencies. For the trainer, the foremost competency is the ability to remain current in a field of expanding technology and growth. While the training leaders may be expected to be experts in most of the areas in the module series, the teachers who eventually will be trained will not be experts in all of these areas.

The Modules

The TMT modules are designed to be used by training leaders as part of the process of training teacher trainers. The "trainer of trainers" model, described above, serves as the basis for the method by which the training will be disseminated throughout the state; it has two levels of implementation. Trainers working with Project TMT provide the initial training to the existing training leaders in the state. These training leaders work at the regional and local level, and represent the first level of training to be accomplished. The second level of training will occur when the training leaders themselves present workshops to teachers and new trainers in the state.

Since the TMT materials are intended for experienced trainers, no attempt has been made to provide in-depth coverage of the issues. Rather, activities are provided along with an accompanying narrative that summarizes the basic concepts contained in the activities. The TMT materials represent one source of information for trainers. In a sense, they are another reference to be added to the trainer's collection, and to be used according to the discretion of the trainer. For some trainers, the modules will provide a convenient outline or summary of relevant issues. Inexperienced trainers may need to follow the modules more closely.

Practitioners are aware of the constantly changing nature of the field of educational computing. This places an added burden on trainers -- that of keeping current about new and on-going developments. While the modules identify the significant issues involved in each area, trainers must constantly up-date their knowledge of the topics covered in the module materials. This is probably best accomplished by reading current educational computer

periodicals, as well as professional computing journals, while establishing and maintaining on-going lines of communication with other experts in the field.

The format of the modules. In order to make the best use of the modules, trainers need to have a basic familiarity with the format. To facilitate ease of use, several identifiable elements are used to create a consistent framework. The general features appearing in each of the modules, are: (1) Overview, (2) Goals, (3) Prerequisites, (4) Competency List, (5) Issues, (6) Activity List, (7) Activities, (8) Blackline Masters and, (9) Module Feedback Form . A table of contents is also included. Each of the elements performs certain functions that will aid a trainer in designing a workshop.

The first page of a module contains the Overview, Goals and Prerequisites. Each Overview provides a short summary of the direction of the module's activities. The trainer can use the Overview of a module in order to arrive at a general idea of the contents of the module. For example, the Overview of the *Training Methods* module states that, " This module will aid trainers who plan and present training sessions on various aspects of educational computing. It provides information in three areas: the use of TMT modules to assist in planning specific workshops, a review of presentation skills and, information about adult learners." The Goals consist of specific statements that describe what both the training leaders and participants will do in the workshops. (See Appendix 1.) The Prerequisites section specifies the skills that participants should have prior to attending the sessions in order to successfully complete the module's activities. In the *Training Methods* module, the Prerequisites state, "Trainers need experience in preparing and presenting computer in-service training for teachers. Experience is also needed in the use of microcomputers in educational settings."

The second page of a module lists the Competencies, specific statements of the skills, knowledge or attitudes that will be developed by the module activities. The Competency List is followed by the Issues section, which provides a summary of information as a background to the tasks contained in the activities. These sections vary in length from ten to twenty pages, according to the detail required by the module topic. Selected references are also included. The Activity List contains the module activities listed by number in the order in which they appear. Brief descriptions of the Activities follow the Activity List. Each includes the method of presentation, approximate length of time, a description of the activity, materials needed and pertinent references to the Issues section. Master copies that can be used to create transparencies and handouts are included in the Blackline Masters section. Each module also contains a Module Evaluation Form which can be completed by the trainer and returned to Project TMT. After using the module materials, the trainer can identify both the strong and weak points of the module, along with suggestions for additional activities or resources. This is a critical point in the development of the modules as materials which can be modified when necessary.

Using the modules with various audiences. Depending upon the audience, there are several possible sequences or groups of modules that can be used to address specific needs. It is recommended that training leaders attend training sessions for each of the modules, in order to become aware of the types of materials contained in them.

Training for this audience begins at a fundamental level and proceeds through specialized applications: *Training Methods, Basic Technical Skills, Hardware Configuration, District Planning, Applications, Software Evaluation, Instructional Methods, Telecommunications, Administrative Uses, Software Design, Instructional Management, Computers in the Curriculum* and *Future Images*. It is important to remember that the order can be changed to reflect local interests. For example, after the *Training Methods* module, the leader may choose *District Planning, Instructional Methods* and *Applications* instead of the above sequence.

Trainers of district-level administrators will find administrative-level activities in the following modules: *Computers in the Curriculum, Administrative Uses, Applications, District Planning,* and *Instructional Methods*. Audiences of building-level administrators may be served by activities found in: *Computers in the Curriculum, Administrative Uses, Instructional Methods, Instructional Management, Software Evaluation* and *Software Design*. The trainer conducting workshops for teachers in the content areas might choose activities from *Instructional Methods, Applications, Software Evaluation, Software Design* and *Instructional Management.*

These sequences are based on the assumption that workshop participants have some experience in using computers. When this is not the case, the *Basic Technical Skills* module can be used to develop basic skills for operating computers.

Steps in using the modules. Activities in the modules were not designed for use in a "cookbook" approach to training in which the trainer merely follows the prescribed activities. Use of the modules may be as rigid or as flexible as the approach of the trainer. A flexible treatment will permit more individual consideration. After a thorough assessment of the skills and needs of the participants, a trainer can determine the appropriate goals. Once the relevant goals have been established by the trainer, the content and sequence of the training materials can be adjusted to fit the individual trainer's teaching style, the needs of the audience, and time and resource constraints. After reviewing the TMT module series and selecting the needed activities from the modules and other sources, training leaders examine the competency lists and the issues sections. Special attention is given to the sections that relate directly to the selected activities.

Additional Project Activities. Project TMT staff solicited recommendations from training workshop participants; these suggestions focused on the desire of trainers for readily usable materials to organize their own training efforts. The original training materials piloted by Project TMT met this demand, but it became evident that the materials would need continuous updating to reflect new ideas.

Project TMT also conducted a three day workshop in April 1985, to give initial training, and to pilot five modules. The participants then completed an evaluation of the workshop activities. Several sessions concerning the principles and strategies of training have been delivered at various conferences throughout the state, in addition to seminars offered through the Professional Development Office at The University of Michigan, School of Education.

To facilitate communication among the members of the Microcomputer Network Committee, the five software centers and Project TMT communicate via a teleconference. The teleconference is a computer mainframe-based conferencing system CONFER (Meeks, 1985), which is supported by The University of Michigan and has phone networks (local exchange nodes) throughout the state. CONFER allows public discussion, private messages, and other communications, to be delivered in a coordinated manner based on a concept of information mapping (see Appendix 1).

PRELIMINARY OBSERVATIONS

Project TMT trainers have conducted training sessions at the Regional Centers and other locations. Several observations appear to be common to all participants at the sites. First, the participants come from diverse fields in education. Training groups have generally been composed of people with the following titles: principal, teacher, REMC director, ISD consultant, media specialist, computer enhancer, computer coordinator, instructional computer specialist, computer aide, administrative supervisor, computer evaluator, counselor, and library/computer coordinator. Second, participants seem to vary in their experience as trainers into at least two broad levels: experienced and inexperienced.

The initial training sessions average about 2 hours per module. The effects of the training, and the participants understanding of the materials is related to the participants experience level. The experienced trainers saw the sessions as an opportunity to review the module content and familiarize themselves with the competencies. Typically, these trainers also were able to share their experiences with the group and suggest variations on concepts and activities based on their experience.

The inexperienced group viewed the sessions as an opportunity to be trained to become trainers. Lacking experience, it was often difficult for them to relate to other trainers' experiences or to fully absorb the training.

These initial impressions are being studied more systematically, but initial impressions indicate a need to adapt future training sessions to these findings. An overview of the modules as a resource is appropriate for advanced level trainers. This type of session would stress the organization of the modules, the manner in which they can be adapted to local conditions, and the sharing of training techniques and ideas.

A different approach is needed for less experienced trainers. In addition to becoming familiar with the module structure, these participants need more intensive training, longer sessions, more specific examples, practice training, and hands-on experiences during the training sessions. Consequently, more time is needed to deliver these sessions than the ones for experienced trainers.

Time for trainers to take training is a scarce resource. Due to local districts requirements, it is difficult for trainers to find time to attend trainer training sessions. It is often difficult for teachers who also function as trainers to get

classroom released time to attend sessions. In response to this need, additional training sessions are being planned for the summer vacation.

Critical to the success of the trainer of trainers model is the ability of the newly trained trainers to be able to effectively train other trainers. There is concern however, that since the training is strictly voluntary, and there are no external incentives (internal incentives refer to the need for local trainers to have materials to make it easier to train) for offering training sessions, that insufficient amounts of trainer-training will take place in this year of the grant. The regional centers have been able to provide the project with the required trainees. Without additional incentives, it is not clear how long this participation will last. Additional incentives will need to be explored.

CONCLUSIONS

The success of the modules is related to their relevance and currency. The quality of the modules can be maintained by the encouraging input of new ideas in the form of training activities or new issues from the trainers and consumers of the modules. Feedback sheets are built into the modules and users are encouraged to submit new ideas. Initial impressions of the format of the module have been that they are favorably accepted by trainers.

These modules deal with general issues. If the format proves appropriate, then more specific level modules can be developed. By using a consistent format, and encouraging a cooperative model throughout the state, various educational agencies can share training concepts and content ideas. It is the goal of the project to encourage participation by providing a uniform format for sharing and discussing critical issues in training Michigan teachers in the best use of microcomputers in the schools.

REFERENCES

Bauman, Ann, R., (1979), editor, ***Training of Trainers: Resource Manual.*** Revised. National Drug Abuse Center for Training and Resource Development, Gaithersburg, Maryland.

Rheinhold, Fran, and Corkett, Kay, (1985), "Mandates: Yes, No, Maybe; EL'S fifth annual survey of the states," ***Electronic Learning,*** October.

Appendix 1

An Example of a Computer CONFERence Session

The following is a sample of activities that take place on this conference (note: names have been changed):

Following system log-in procedures (typed-in commands are in CAPS, system responses are in **bold***) a typical example appears below :*

```
#$SOURCE MICH:TIME
#$Run CNFR:Confer t=5 par=MICH:TIME
#Execution begins

 Confer II (08/85) - designed by Robert Parnes
 Copyright & Trademark: Advertel Communication Systems

  CONFERence for MICH:TIME
  Paul Stemmer, Organizer (313)-764-8435

DO NEXT? INDEX

    Index for MICH:TIME

Computer Science Certification
Software Evaluation and Database
Information Distribution/Dissemination
Computer Literacy (for better or wor. .
MISC
Network Activities
Modules
Retired and updated items

..Items are also indexed by author, E.g. INDEX SMITH
WHICH CATEGORY?  COMPUTER LIT
Computer Literacy (for better or wor. .
Items in this category
  10   12
CATEGORIZE WHICH ITEMS? 12
Done
* THESE ITEMS? Y
These items are now the * items

DO NEXT? ITEMS *

Item 12 12:02 Mar17/85   8 lines   14 responses
Charles P                          Prime=10
PROPOSAL TO DEVELOP MEANS OF ASSESSING COMPUTING LITERACY

I propose that those persons interacting here begin the development of
the base ideas needed to formulate alternative means of demonstrating
K-12 students have achieved computing literacy.   I suggest that we
```

exclude course completion as a means. If the list of responses begins to get very long, I'll suggest alternative items in which to further discuss particular concepts.

Related items: 10, 14

14 Responses

. . .

Apr11/85 08:40
12:6) Karen W: University of Iowa has developed the STCL (Standardized Test of Computer Literacy). The test has been under development for about 2 years and does not test programming. It deals with attitudes about computer use and so forth. My concern is about computer literacy and tests that measure competencies which include references to joysticks and paddles. The competencies were developed before touch tablets and electronic rodents (mouse). The review cycle in Florida is such that there will be little chance of updating the competencies on a timely basis. I would prefer evolutionary computer literacy that continues to meet student needs and reflects changes in technology that kids are experiencing outside the school environment.
- - - - -
Apr11/85 21:47
12:7) Charles P: I support your position Karen. Yet we cannot ignore our educational colleagues and the State Dept. staff that feel a "test" is a necessary control. How can we respond positively, without supporting the wrong kind of testing?
- - - - -

. . .